

What is claimed is:

1. A method of producing a polyester fire-retardant core matrix for a prefabricated panel, comprising:

5 a) cutting a polyester floss such that the cut polyester floss has a predetermined width;

b) adding a fire-retardant agent to the cut polyester floss to allow the fire-retardant agent to permeate into the cut polyester floss, and rolling the polyester floss, 10 drenched by the fire-retardant agent, using a roller to promote permeation of the fire-retardant agent into the polyester floss;

c) removing the excess fire-retardant agent from the polyester floss, drenched by the fire-retardant agent, using 15 a perforated roller, of which an air suction force is easily controlled;

d) drying the polyester floss, drenched by the fire-retardant agent, using a drying unit; and

e) heating the dried polyester floss using a heater to 20 foam the fire-retardant agent securely attached to fiber structures of the dried polyester floss.

2. The method as set forth in claim 1, wherein at least one step of the steps of b) to e) is repeated two 25 times or more.

3. The method as set forth in claim 1, further comprising continuously reversing the cut polyester floss by an angle of 90 degrees using a reverse device, including a
5 pipe twisted by the angle of 90 degrees, to allow the cut polyester floss to be vertically grained after the step of a).

4. The method as set forth in claim 1, further
10 comprising sequentially RP- and trimming-processing the polyester floss using a tip-saw or a disc cutter after the step of d) or the step of e).

5. The method as set forth in claim 1, wherein the
15 adding of the fire-retardant agent to the cut polyester floss is conducted through a spray process using upper and lower nozzles.

6. The method as set forth in claim 1, wherein the
20 fire-retardant agent contains 5 to 30 parts by weight of fire-retardant additive, based on 100 parts by weight of sodium silicate solution, and a concentration of solids in the fire-retardant agent is 30 to 70 %, the fire-retardant additive being selected from the group consisting of sodium
25 phosphate monobasic, magnesium hydroxide, an ester

phosphate-based compound, aluminum oxide, aluminum hydroxide, antimony oxide, molybdates, zinc tartarate, and a mixture thereof.

5 7. The method as set forth in claim 1, wherein the perforated roller in the step of c) comprises two sets or more upper and lower rollers, and an interval between the upstream upper and lower rollers is narrower than an interval between the downstream upper and lower rollers.

10 8. The method as set forth in claim 1, wherein the drying unit in the step of d) is one or more selected from the group consisting of a microwave generating unit, a steam chamber, a hot air circulation chamber, and a combination
15 thereof.

 9. The method as set forth in any one of claims 1 to 8, wherein two or more microwave generating units are used to dry the polyester floss in the step of d), and steam is
20 vented using preheated air, passing through a microwave region, through an air blowing device and an air suction device at an end stage of the step of d).

 10. The method as set forth in any one of claims 1 to
25 8, wherein two or more hot air circulation chambers are used

in the step of d) to upwardly and downwardly circulate hot air to evaporate moisture from the fire-retardant agent attached to the polyester floss to dry the polyester floss.

- 5 11. The method as set forth in claim 1, wherein the heater used in the step of e) is a ceramic heater or a hot air circulation heater, and the polyester floss is heated at 150 to 250°C for 3 to 20 min to foam the fire-retardant agent attached to the polyester floss.

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